An Examination of Climate and Fisheries Effects Upon Ecosystem Dynamics of the Strait of Georgia Compared to Larger Northeast Pacific Ecosystems

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An ecosystem model of the Strait of Georgia was constructed to examine how climate and fisheries effects have been manifested as bottom up and top down processes. Two larger scale models of Northeast Pacific Ocean ecosystems, one encompassing the whole BC coast and continental shelf and the other comprised of the Eastern Bering Sea, Gulf of Alaska and BC Coast combined. Species groups were the same for all three ecosystems modelled, with a focus upon commercially important fish species. The models are dynamic and span the period from 1950 to the present. Time series data for biological indicators were compared to predicted model time series given different scenarios of ecosystem control; top down, bottom up, or combinations thereof. Primary production anomalies, were generated to minimise differences between observed and predicted time series to simulate climate driven bottom up trophic changes. Comparison of the predicted primary production anomalies to decadal cycling seen in climate indices showed a linkage between ecosystem models and climate indicators of similar spatial scale. By linking ecosystem dynamics to climate scale and population responses more appropriate ecosystem models can be built with which to consider research and management issues.